EPA/OPP MICROBIOLOGY LABORATORY
ESC, Ft. Meade, MD

Standard Operating Procedure
for
Systems Check for the Beckman (DU Series 500) Spectrophotometer

SOP Number: EQ-04-03

Date Revised: 04-25-05

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1.0 SCOPE AND APPLICATION:

1.1 This protocol describes the procedures for the systems check for the Beckman (DU Series 500) Spectrophotometer.

2.0 DEFINITIONS:

2.1 Sampling module = the part of the Beckman spectrophotometer where the cuvette-containing the sample is placed.

2.2 MSDS = Material safety data sheet.

3.0 HEALTH AND SAFETY: Not applicable

4.0 CAUTIONS:

4.1 Maintain an ambient temperature of 10-40°C for proper instrument operation.

4.2 Leave at least a 15 cm clearance at the top and on all sides for air circulation. Keep the air vents under the instrument clean and free of materials that might obstruct the air flow.

4.3 Allow the instrument to warm up for a minimum of 15 minutes before taking any sample readings.

4.4 Lenses are located on both sides of the sampling module. Wipe lenses with a soft lint-free and oil free cloth to clean. Do not use organic solvents such as acetone to clean the lenses.

4.5 Keep the inside of the module clean and dry.

4.6 Prior to use, the analyst must be present during the entire system check of the instrument and must either hear the three beeps or observe the “pass” statement on the machine in order to verify that the instrument has passed the system check.

5.0 INTERFERENCES:

5.1 The entire sampling module must be kept clean. If it becomes dirty, wipe it clean with soap and water and a soft cloth.

6.0 PERSONNEL QUALIFICATIONS:

6.1 Personnel are required to be knowledgeable of the procedures in this SOP.

7.0 SPECIAL APPARATUS AND MATERIALS:

7.1 Beckman DU Series 500 spectrophotometer: wavelength range 190-1100 nm, wavelength accuracy ± 0.1 nm, wavelength repeatability 0.1 nm, photometric readout −0.3 to 3.0 A or 0.1-200.0% T, photometric accuracy ± 0.005 A (1A at 546.1 nm), stray light ± 0.05% T maximum at 220 nm and 320 nm, scanning speed 40-1000 nm/min

8.0 INSTRUMENT OR METHOD CALIBRATION:

8.1 The Beckman DU 500 spectrophotometer is sent out to a private contractor on an annual basis for certification.

9.0 SAMPLE HANDLING AND STORAGE: Not applicable

10.0 PROCEDURE AND ANALYSIS:

10.1 The Beckman DU 500 Series spectrophotometer contains internal diagnostic tests to aid in self-diagnosis, and a system check to validate the performance of the instrument. Software upgrades are performed by uploading new system and applications software via a computer.

10.2 Each time the instrument is powered up, a series of diagnostic tests is performed automatically to ensure operation of major system components. This procedure, which takes two minutes, checks the memory, voltage, systems, offset correction, lamp alignment, and the wavelength calibration. The instrument contains programs for checking wavelength accuracy, bandwidth, photometric noise, stray light, photometric accuracy, photometric repeatability and photometric stability.

10.3 When all tests are complete, the main menu is displayed. The screen displays 'Pass' to denote that each of these areas are functioning properly. Record results of the diagnostic check on the Beckman (DU Series 500) Spectrophotometer Systems Check Record Form (see 16.1). Analyst must remain in the room during the system check of the instrument (see cautions section 4.6)

10.4 The spectrophotometer can be programmed with a listing of analysis parameters that the user has selected and has chosen to store for later recall (see ref. 15.1).

10.5 The instrument has the capacity to store up to 200 readings taken in the fixed wavelength mode.

11.0 DATA ANALYSIS/CALCULATIONS: None

12.0 DATA MANAGEMENT/RECORDS MANAGEMENT:

12.1 Data will be recorded promptly, legibly and in indelible ink on the Systems Check Record Form (see 16.1). Completed forms are archived in notebooks kept in secure file cabinets in the file room D217. Only authorized personnel have access to the secured files. Archived data is subject to OPP's official retention schedule contained in SOP ADM-03, Records and Archives.

13.0 QUALITY CONTROL:

13.1 The OPP Microbiology Laboratory conforms to 40 CFR Part 160, Good Laboratory Practices. Appropriate quality control measures are integrated into each SOP.

13.2 For quality control purposes, the required information is documented on the appropriate form (see 16.1).

14.0 NONCONFORMANCE AND CORRECTIVE ACTION:

14.1 If any function does not pass or if any error messages are displayed, refer to section 17, Troubleshooting in the Operating Instructions (see ref. 15.1) and, if necessary, contact the manufacturer for assistance. Record corrective actions on the Systems Check Record Form under "Comments." Take spectrophotometer out of service if troubleshooting does not resolve the issue. Arrange for service by a qualified company or vendor.

15.0 REFERENCES:

15.1 Operating Instructions: Beckman DU Series 500 Spectrophotometer.

16.0 FORMS AND DATA SHEETS:

16.1 Beckman (DU Series 500) Spectrophotometer Systems Check Record Form

Beckman (DU Series 500) Spectrophotometer
Systems Check Record

OPP Microbiology Laboratory

Date/ Initials	Pass/ Fail	Comments